CLAIMS

What is claimed is:

1. At a station of a contention-based WLAN system in which the station is adapted to operate in awake and doze states, a method comprising:

(A) with the station in the awake state and an access point (AP) of the system informed that the station is in the awake state, transmitting to the AP a closing frame, wherein a designated bit in the closing frame informs the AP that the station will transition to the doze state; and

(B) transitioning the station from the awake state to the doze state.

2. The method of claim 1, wherein the contention-based WLAN system conforms to an IEEE 802.11 standard.

3. The method of claim 1, wherein the contention-based WLAN system conforms to an extension of an IEEE 802.11 standard.

4. The method of claim 1, wherein steps (A) and (B) are performed independent of any beacon schedule for the system.

5. The method of claim 1, further comprising receiving from the AP an acknowledgement frame corresponding to the closing frame.

6. The method of claim 1, wherein the designated bit is a power management bit of an IEEE 802.11 standard.

7. The method of claim 6, wherein step (A) comprises:

starting a timer; and

transmitting the closing frame either after receiving a data frame from the AP or after the timer reaches a threshold value.

8. The method of claim 7, further comprising receiving the data frame from the AP, wherein the closing frame is an acknowledgement frame corresponding to said data frame.

9. The method of claim 7, wherein the timer reaches the threshold value and the closing frame is a null frame.

10. The method of claim 1, wherein the designated bit is a more data bit of an IEEE 802.11 standard.

11. The method of claim 10, wherein:

the closing frame is a data frame; and

step (A) comprises receiving from the AP an acknowledgement frame corresponding to the closing frame.

12. The method of claim 1, wherein step (A) comprises receiving a first data frame from the AP, wherein a designated bit in the first data frame informs the station whether the AP has further data to transmit to the station.

13. The method of claim 12, wherein, when the designated bit in the first data frame informs the station that the AP has further data, the station transmits an acknowledgement frame corresponding to the first data frame, wherein a designated bit in said acknowledgement frame informs the AP that the station will remain in the awake state and be available to receive at least one further transmission from the AP.

14. The method of claim 13, wherein step (A) comprises receiving a second data frame from the AP, wherein a designated bit in the second data frame informs the station whether the AP has further data to transmit to the station.

15. The method of claim 12, wherein, when the designated bit in the first data frame informs the station that the AP has further data, the station transmits the closing frame.

16. The method of claim 1, further comprising:

(C) with the station in the doze state, transitioning the station from the doze state to the awake state; and

(D) transmitting to the AP a first frame, wherein a designated bit in the first frame

informs the AP that the station will remain in the awake state and be available to receive at least one transmission from the AP.

17. At an access point (AP) of a contention-based WLAN system in which a station is adapted to operate in awake and doze states, a method comprising:

(A) with the station in the awake state and the AP informed that the station is in the awake state, receiving from the station a closing frame, wherein a designated bit in the closing frame informs the AP that the station will transition to the doze state; and

(B) refraining from transmitting frames to the station until a notification is received that the station is in the awake state.

18. The method of claim 17, wherein the contention-based WLAN system conforms to an extension of an IEEE 802.11 standard.

19. The method of claim 18, wherein the designated bit is a more data bit of the IEEE 802.11 standard.

20. The method of claim 17, wherein steps (A) and (B) are performed independent of any beacon schedule for the system.

21. The method of claim 17, wherein:

the closing frame is a data frame; and

step (A) comprises transmitting to the station an acknowledgement frame corresponding to the closing frame.

22. The method of claim 17, wherein step (A) comprises transmitting a first data frame to the station, wherein a designated bit in the first data frame informs the station whether the AP has further data to transmit to the station.

23. The method of claim 22, wherein, when the designated bit in the first data frame informs the station that the AP has further data, the station transmits an acknowledgement frame corresponding to the first data frame, wherein a designated bit in said acknowledgement frame informs the AP that the station will remain in the awake

state and be available to receive at least one further transmission from the AP.

24. The method of claim 23, wherein step (A) comprises transmitting a second data frame to the station, wherein a designated bit in the second data frame informs the station whether the AP has further data to transmit to the station.

25. The method of claim 22, wherein, when the designated bit in the first data frame informs the station that the AP has further data, the station transmits the closing frame.

26. A station in a contention-based WLAN system, the station adapted to operate in awake and doze states and comprising:

a processor and a transceiver, wherein:

(A) with the station in the awake state and an access point (AP) of the system informed that the station is in the awake state, the processor configures the transceiver to transmit to the AP a closing frame, wherein a designated bit in the closing frame informs the AP that the station will transition to the doze state; and

(B)the processor configures the station to transition from the awake state to the doze state.

27. A contention-based WLAN system, comprising an access point (AP) and a station, wherein:

the station is adapted to operate in awake and doze states; and

the station comprises:

a processor and a transceiver, wherein:

(A)with the station in the awake state and the AP informed that the station is in the awake state, the processor configures the transceiver to transmit to the AP a closing frame, wherein a designated bit in the closing frame informs the AP that the station will transition to the doze state; and

(B) the processor configures the station to transition from the awake state to the doze state.

28. An access point (AP) of a contention-based WLAN system in which a station is adapted to operate in awake and doze states, the AP comprising a processor and a

transceiver, wherein the processor configures the transceiver:

(A) with the station in the awake state and the AP informed that the station is in the awake state, to receive from the station a closing frame, wherein a designated bit in the closing frame informs the AP that the station will transition to the doze state; and

(B) to refrain from transmitting frames to the station until a notification is received that the station is in the awake state.

29. A contention-based WLAN system, comprising an access point (AP) and a station, wherein:

the station is adapted to operate in awake and doze states; and

the AP comprises a processor and a transceiver, wherein the processor configures the transceiver:

(A) with the station in the awake state and the AP informed that the station is in the awake state, to receive from the station a closing frame, wherein a designated bit in the closing frame informs the AP that the station will transition to the doze state; and

(B) to refrain from transmitting frames to the station until a notification is received that the station is in the awake state.